



JUN 20 10 30 AM '94
HAZARDOUS MATERIALS
MANAGEMENT DIVISION

June 16, 1994

Mr. Matt Germon
VT DEC
Sites Management Section
103 South Main Street
Waterbury, VT 05671-0404

Re: Waterville Garage, Site Assessment Report - DEC Site #92-1315

Dear Mr. Germon:

Enclosed is a copy of Griffin's Report on the Investigation of Subsurface Petroleum Contamination at the Waterville Garage. Please review the report and feel free to contact me if you have any questions or comments.

Sincerely,

Mike Cassara, P.E.

Enclosure

cc: Mr. Bruce Davis, w/o enclosure

**REPORT ON THE
INVESTIGATION OF SUBSURFACE
PETROLEUM CONTAMINATION
AT THE WATERVILLE GARAGE,
WATERVILLE, VERMONT**

VTDEC SITE #92-1315
GRIFFIN PROJECT #10934451

JUNE 2, 1994

Prepared for:

Mr. Bruce Davis
Waterville Garage
P. O. Box 132
Waterville, VT 05492

Prepared by:

GRIFFIN INTERNATIONAL, INC.
P. O. Box 943
Williston, Vermont 05495-0943
(802) 865-4288

TABLE OF CONTENTS

	PAGE
I. INTRODUCTION	1
II. SITE BACKGROUND	
A. Site Description	1
B. Site History	1
III. INVESTIGATIVE PROCEDURES	
A. Exploratory Soil Boring	2
B. Stockpiled Soil Screening	2
IV. RECEPTOR RISK ASSESSMENT	3
V. CONCLUSIONS	3
VI. RECOMMENDATIONS	4

APPENDIX

Site Location Map
Site Map
Boring Log

I. INTRODUCTION

This report details the investigation of residual subsurface petroleum contamination at the Waterville Garage, in Waterville, Vermont. Included in this report is a description of drilling activities, stockpiled soil screening results, a receptor risk assessment, conclusions of the investigation, and recommendations. This work has been conducted by Griffin International, Inc. (Griffin) for Mr. Bruce Davis of the Waterville Garage, in response to a letter from the Vermont Department of Environmental Conservation (VTDEC) dated September 7, 1993.

II. SITE BACKGROUND

A. Site Description

The Waterville Garage is located on Route 109 in Waterville, Vermont. It is approximately one quarter of a mile south of the Route 109 terminus of the Bakersfield road (see Site Location Map in Appendix). The North Branch of the Lamoille River flows generally northward and is approximately 250 feet west of the site at its nearest point. The Surficial Geologic Map of Vermont indicates the presence of well sorted sand and beach gravels in the vicinity of the Waterville Garage. The site is situated in a hilly area with steep slopes that trend toward the North Branch. Materials encountered at the site during this investigation varied from silty fine sand to fine and medium sand.

According to the owner, Mr. Bruce Davis, the Waterville Garage was constructed on its present site after a considerable amount of excavation was done on the site. Mr. Davis also said that bedrock was approximately thirty feet below grade, and that there was no groundwater at the site. The presence of bedrock was confirmed in the area of drilling to be at 29 feet below grade.

The area surrounding the Waterville Garage contains a mixture of commercial, residential, and agricultural land uses. The Waterville Garage is located on the main road in Waterville and is across the road to the east of the Town Clerk's Office. Other commercial establishments and residences are to be found to the north and south of the site along Route 109. According to Mr. Davis, drinking water for the area is supplied by the Village of Waterville. Area residents dispose of sewage by means of on site septic.

B. Site History

On October 14, 1992, two underground storage tanks (USTs) were removed from the subsurface at the Waterville Garage. The tanks were used for the storage of gasoline, and had capacities of 1,000 gallons and 2,000 gallons. They were being removed because they were no longer being used.

An assessment of the tank removal was performed by New England Industrial Maintenance. According to the report submitted to the DEC by New England Industrial Maintenance, the tanks appeared to be in good condition, but petroleum contamination was detected in the excavation. Contamination in the former tank pit exhibited a peak reading of 348 ppm, with an average of 129 ppm. Approximately 27 cubic yards of contaminated soil were removed from the excavation, stockpiled on site, and covered with polyethylene sheeting. PID readings of the stockpiled soils at the time of their excavation ranged from 258 ppm to 424 ppm, with an average of 342 ppm.

In response to the presence of petroleum contamination at the site, the VTDEC issued a letter dated September 7, 1993, requesting further investigation of the degree and extent of contamination. In the letter, the VTDEC requested that the soils downgradient of the former tank pit be screened for volatile organic compounds (VOCs), that the stockpiled soils also be screened for VOCs, and that a receptor survey be performed.

III. INVESTIGATIVE PROCEDURES

A. Exploratory Soil Boring

In an effort to further determine the degree and extent of residual petroleum contamination at the site, Griffin supervised the drilling of a soil boring in the vicinity of the former tank pit on February 16, 1994. Green Mountain Boring drilled at the site using a hollow stem auger. The drilling was supervised by a Griffin engineer. Split spoon samples taken at five foot intervals were screened for VOCs using a portable photoionization detector (PID). The auger was advanced until it met refusal (assumed to be bedrock), at 29 feet below grade. Contamination was detected throughout the soil profile until refusal was met. No groundwater was encountered during the soil boring. Soil samples screened during the boring all indicated the presence of petroleum contamination, with PID readings ranging from 2.8 parts per million (ppm) at a depth of 25 to 26.5 feet, to 190 ppm at a depth of 15 to 17 feet. Highest concentrations were closer to the surface. Since groundwater was not encountered during the boring, no monitoring well was installed. The Site Map in the Appendix shows the location of the boring. Soil types and characteristics were logged for each five-foot sample. The boring log in the Appendix details this information. Soils in the five split spoon samples consisted of brown to gray fine sand and silty fine sand, with a little gravel near the surface. The soils were well sorted. A silt clay lens was encountered approximately 25 feet below grade.

B. Stockpiled Soil Screening

On May 9, 1994, a Griffin technician visited the site to screen the stockpiled soil. A total of eight soil samples were collected from the soil pile with a hand auger. The samples were taken from different locations around the perimeter of the soil pile at a depth of 3.5 feet into the pile. The samples were screened for the presence of VOCs using a PID. VOCs were detected in all eight samples. PID readings for the samples ranged from

15.2 ppm to 84 ppm. The average reading was 50.7 ppm. The soil had been placed on polyethylene sheeting and covered with polyethylene sheeting.

IV. RECEPTOR RISK ASSESSMENT

Sensitive receptors at this site were visually observed on February 16, 1994 and also on May 9, 1994. Potential receptors observed include the North Branch of the Lamoille River, which is approximately 250 feet to the west of the Waterville Garage. The North Branch is located across Route 109 from the site and down a steep slope which begins about 50 feet west of the road. The river level is approximately 75 to 100 feet below the grade of the Waterville Garage. The river is down gradient of the contamination, and there is a slight risk of impact to it.

Other potential receptors observed include a storm sewer located about 85 feet southwest of the stockpiled soil and the Town Clerk's Office which is a wood frame building located approximately 50 feet southwest of the Waterville Garage building, across Route 109. Griffin attempted to gain access to the Town Clerk's Office in order to screen the building's cellar for VOCs but was unable to.

According to Mr. Davis, the area in which the site is located is served by municipal water and sewer service. He stated that there were no private wells in the vicinity of the site, the nearest being located at least one half mile away, across the North Branch. No private wells were observed by Griffin staff during either site visit.

V. CONCLUSIONS

Based on the result of this investigation, Griffin has concluded the following:

1. Soils collected from the soil borings drilled on February 16, 1994 consisted primarily of fine sands and silty fine sands.
2. Bedrock was confirmed to be 29 feet below grade in the area of the soil boring.
3. No groundwater was encountered during the drilling of the soil boring. Thus, no monitoring well was installed. There does not appear to be a significant overburden aquifer in the vicinity of the former UST area.
4. Significant volatile organic compounds were detected throughout the profile in the soil boring. PID readings between 2.8 and 190 ppm were measured in the samples obtained from the split spoon. The highest readings were measured closer to the surface, indicating that the bedrock aquifer may not be impacted.

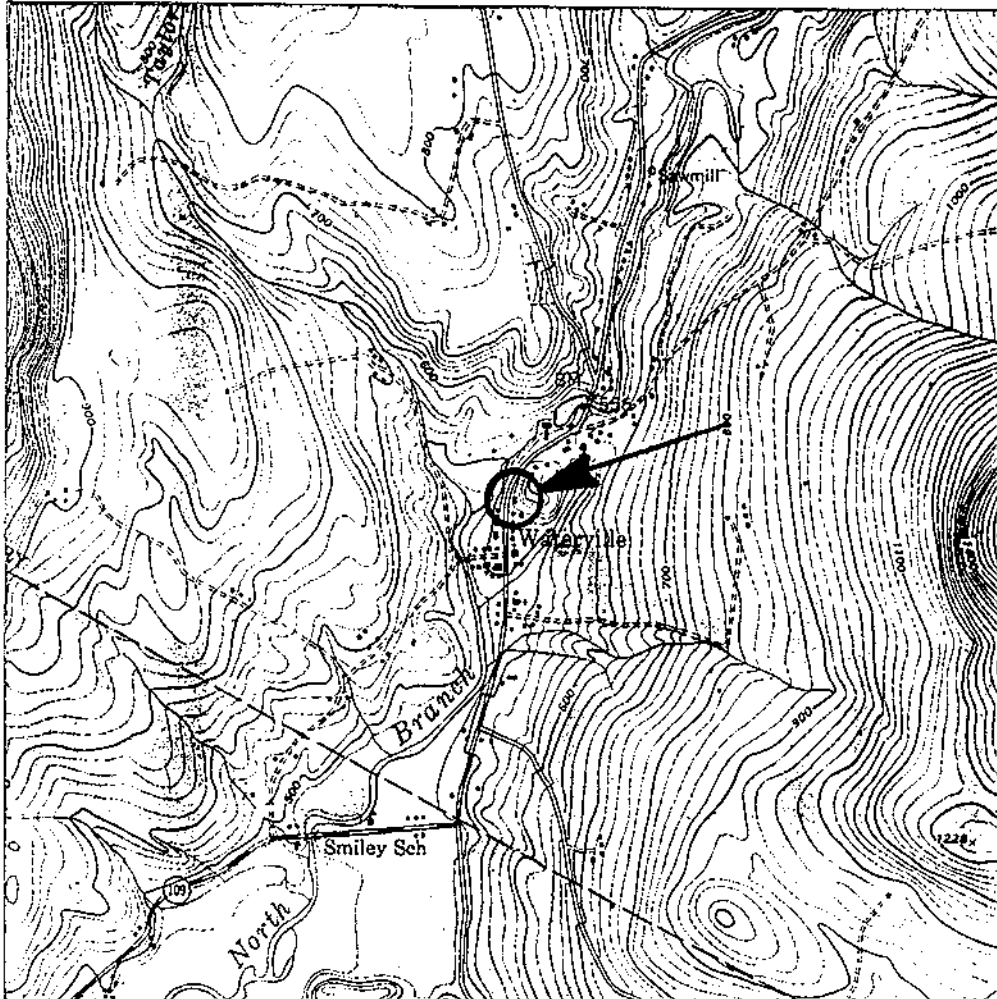
5. Adsorbed petroleum in soils that were removed from the tank pit excavation and stockpiled on site persist. PID readings of this material ranged from 15.2 ppm to 84 ppm, with an average of 50.7 ppm. The stockpiled soil was placed on, and covered with, polyethylene sheeting.
6. Significant biodegradation and/or volatilization of the petroleum hydrocarbons in the stockpiled soil has taken place in the time since the soil was originally stockpiled.
7. The North Branch of the Lamoille River is approximately 250 feet to the west and approximately 75 feet lower in elevation from the Waterville Garage and the stockpiled soil. There is a slight risk of impact to this receptor.
8. Over time, the natural processes of volatilization, biodegradation, and dispersion, should result in a significant decrease in contaminant concentrations.

VI. RECOMMENDATIONS

Based on the above conclusions, Griffin makes the following recommendations:

1. Continue to screen the stockpiled soil at six month intervals until such time that no contamination is detected with a PID. After this occurs the soil can be spread on site, if desired.
2. Since there is no significant groundwater aquifer in the vicinity of the former tank pit and its contaminated soils, and there are no significant risks to potential receptors, we do not recommend additional subsurface investigation at this time.

APPENDIX



JOB #: 10934451
 SOURCE: USGS JEFFERSONVILLE QUADRANGLE



WATERVILLE GARAGE

WATERVILLE, VERMONT

SITE LOCATION MAP

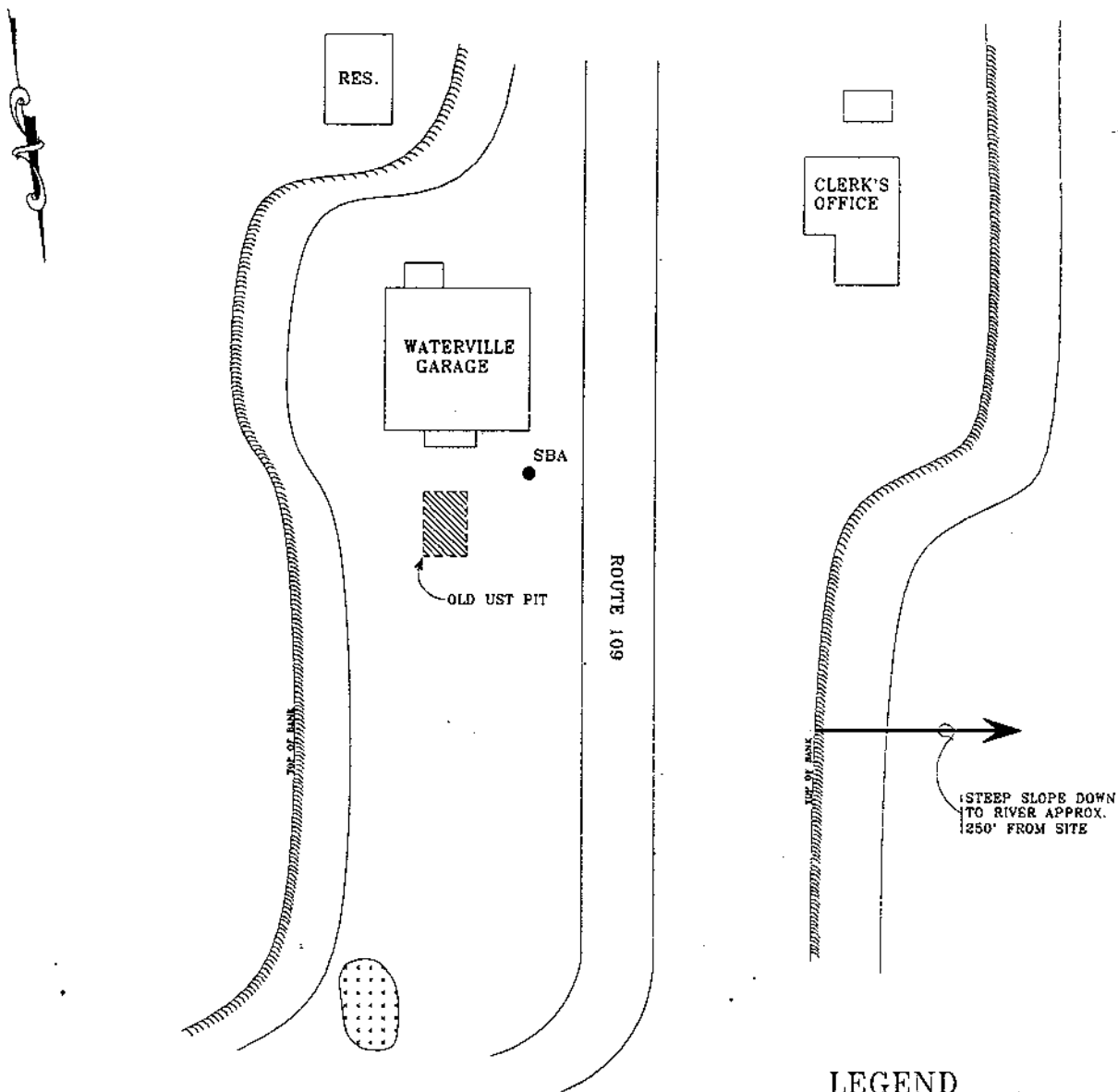
DATE: 2/17/94

DWG.#:1

SCALE: 1:24000

DRN: SB

APP: MC



LEGEND

- SB1 SOIL BORE
- ⬢ SOIL STOCKPILE

JOB #: 10934451

SITE MAP DERIVED FROM FIELD NOTES TAKEN BY M. CASSARA DATED 2/16/94



WATERVILLE GARAGE

WATERVILLE,

VERMONT

SITE PLAN

DATE: 2/17/94

DWG.#: 2

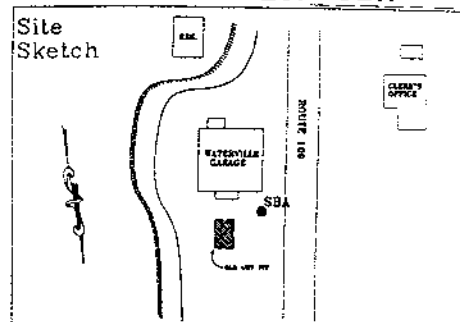
SCALE: 1"=50'

DRN: SB

APP: MC

PROJECT WATERVILLE GARAGE
 LOCATION WATERVILLE, VERMONT
 DATE DRILLED 2/16/94 TOTAL DEPTH OF HOLE 29'
 DIAMETER _____
 SCREEN DIA. _____ LENGTH _____ SLOT SIZE _____
 CASING DIA. _____ LENGTH _____ TYPE _____
 DRILLING CO. GMB DRILLING METHOD HSA
 DRILLER LAWRENCE LOG BY M. CASSARA

WELL NUMBER SBA



GRIFFIN INTERNATIONAL, INC

DEPTH IN FEET	WELL CONSTRUCTION	NOTES	BLOWS PER 6" OF SPOON & PID READINGS	DESCRIPTION/SOIL CLASSIFICATION (COLOR, TEXTURE, STRUCTURES)	DEPTH IN FEET
0		GRADE			0
2					2
4					4
6			5'-7' 100 ppm	Silty fine SAND, little gravel light brown to gray blue	6
8		NATIVE BACKFILL			8
10			10'-12' 34 ppm	Fine brown SAND to gray fine sandy silt, moist	10
12					12
14					14
16			15'-17' 190 ppm	Silty fine SAND, mottled gray moist, strong odor	16
18		BENTONITE			18
20			20'-22' 6 ppm	Light brown fine to medium SAND, dry, little silt	20
22		NATIVE BACKFILL			22
24					24
26			25'-26.5' 2.8 ppm	Silt CLAY lens at 25' above silty fine SAND, moist	26
28					28
30		UNDISTURBED NATIVE MATERIAL		AUGER & SPOON REFUSAL AT 29'	30
32					32
34					34
36					36
38					38
40					40
42					42
44					44
46					46
48					48
50					50